Kulvir Jaydeep Chavda | My Website & Portfolio: www.kulvirchavda.com

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EDUCATION, SKILLS, & COURSES

University of Illinois at Urbana-Champaign - UIUC, *Junior………………………………………..Graduation: May 2026*
B.S in Aerospace Engineering with a Minor in Computer Science (James Scholar Honors)…………...**Cumulative GPA: 3.82**
*Fall 2024, Grainger College of Engineering Dean's List (Semester GPA: 4.0)

- **Skills:** Java, Python, C++, Arduino C++, HTML/CSS/JS, ROS2, Linux/Unix, MATLAB & Simulink, SysML Siemens NX, Fusion 360, CATIA, SolidWorks, Eagle EDA, Proteus V8, BurnSim, Git, CFD, Finite Element Analysis, 3D Printing, Design for Manufacturing, Design/Process Optimization, PFMEA, Test Design/Analysis, Soldering, Microsoft Office.
- **Taken/In-Progress:** Incompressible/Compressible Flow, Aero Structures, Aero Dynamical/Control Systems, Aero Flight Mechanics, Numerical Methods, Theoretical & Applied Dynamics, Calculus & Linear Algebra, Full C.S. Core & Electives.

WORK EXPERIENCE & ENGINEERING PROJECTS

Aerospace Engineering R&D Intern *June, 2024 – August, 2024*
Adani Defence & Aerospace

- Conducted foundational research and design for short-range missile systems targeting drone countermeasures.
- Wrote 50+ project requirements to design/present a precise 2-month action plan to go from concept-to-design successfully.
- Conceptualized 3 engineering design variants, with CAD, for senior engineers within 2 weeks to start project development.
- Designed vehicle trajectory manually and modelled it using Python to build an appropriate control system for the vehicle.
- Calculated potential propulsive & aerodynamic forces, by hand, on vehicle and optimized structure materials accordingly.
- Created weekly presentations to verify technical integrity, conduct PFMEA, and reduce manufacturing time by 20-50%.
- Authored a 40-page final engineering design report outlining research, math, references, CAD/blueprints, and future steps.

Head of Technical Projects *January, 2023 – Present*
Minorities in Aerospace (MAero) – University of Illinois, Urbana Champaign

- Planning, advising, and recruiting engineering students for any technical initiatives undertaken by MAero.
- Leading technical project teams to design/build a High-Altitude Rocket, Sustainable Airplane, and fully 3D-Printed Drone.
- Spearheading engineering sessions to define system requirements, brainstorm designs, build prototypes, and plan budgets.
- Secured $2,500 of funding from Blue Origin in my first semester & organized a research event with 5+ professors.

Aerospace Educational Development & Outreach Mentor *April, 2023 – May, 2024*
Department of Aerospace Engineering – University of Illinois, Urbana Champaign

- Taught 15+ STEM teachers & students in rocket science, guiding them through building, flying, and analyzing rockets.
- Built, optimized, and troubleshooted 150+ short range rockets & avionics to collect flight data & analyze trends.

Project Systems Engineer *August, 2023 – November, 2023*
Department of Defense S.T.E.M. Vertically Landed Rocket Challenge, UIUC

- Built a lander that, under free fall, used a dual-servo solid rocket motor to reorient and land itself from an altitude of 30m.
- Utilized UIUC's VLR parts resource & online avionics programming library to optimize our model & simulate landings.
- Achieved successful burn and recorded avionics data from 3 sensors to analyze stability and improve future designs.

RESEARCH & WRITING

Researcher & Systems/Controls Engineer *November, 2024 – Present*
Non-Linear Autonomous Control, Exploration, Intelligence & Systems Lab (N-ACXIS) – Dr. Hiroyasu Tsukamoto

- Designing three foundational experiments for hardware implementation, testing, and verification of autonomous three-dimensional GNC algorithms in swarms of n-numbered heterogenous unmanned aerial vehicles for unmapped terrains.
- Implementing AI-based controls theory research using 5+ types of Python/ROS2 controlled S.L.A.M based UAVs/Robots.
- Design and tune simulations for advanced flight systems that could utilize alternative control (LQR, PID, Robust, etc.)

Researcher & First Author, University of Illinois at Urbana-Champaign *May, 2023 – May, 2024*
Title: *Using the Drag Equation and Euler's Method in Python to Predict Model Rocket Flight Trajectories*

- Utilized rocket flight data (24 flights), thrust tests, & Python to write an algorithm that predicts accurate rocket trajectories.
- Conducted 25+ solid rocket-motor thrust tests to create accurate theoretical thrust curves to plug into python algorithms.
- Designed the algorithm structure and developed a Python application with a GUI (Graphical User Interface) to take user input and output graphs depicting altitude vs. time and drag force vs. time for the model rocket, both with and without drag.
- Publication awarded 3rd place at the AIAA Region III Conference in April, 2024 (https://doi.org/10.2514/6.2024-84150).